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STUDIES IN *RHYNCHOPHORA*.

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VIII.—ON PHALIDURA. *AMYCTERIDAE*.*

The *Amycteridae* comprise probably somewhere about one thousand species at present existing in Australia and forming one of the most remarkable items in the wonderful insect-fauna of that region. They have recently attracted the attention of Dr. E. W. Ferguson of Sydney, who has published portions of a revision of the family in the Proc. Linn. Soc. N.S.W., beginning in Vol. xxxiv, 1909. This is a most useful and carefully prepared work, and forms an excellent preliminary to a more extended study, which we may hope Dr. Ferguson will be able to undertake when he has completed his present series, and when we may hope the fauna will be better known than it is at present.

The family is as yet in a state when almost all our knowledge is derived from the study of the males, which exhibit very extraordinary characters. The other sex is in the preliminary state of our knowledge almost neglected.

As this communication is limited to the genus usually called *Psalidura*, and as this has never been satisfactorily defined, it is necessary to begin with some statements as to nomenclature that Dr. Ferguson has left open.

Among the first insects of the family described was the "*Curculio mirabilis*" of W. Kirby (Tr. Linn. Soc. xii, 1818). This, as Dr. Ferguson

* The contribution that appeared in this Magazine for July last, was numbered as "4" of the series, but it should have been VII. No. 4 was published by the Ent. Soc. London in 1918, No. 5 by the Hawaiian Ent. Soc. in 1918, and No. 6 appeared in the Journal of the New York Ent. Soc. 1918.

believes, has been wrongly identified, but before considering that more fully it is desirable to deal with the generic term.

The first genus specially described for any member of the *Amycteridae* was by Fischer von Waldheim in the Mém. Soc. Imp. Nat. Moscou, vi, 1823, pp. 265, 266. This description has not been accessible in Australia and it is therefore well to reproduce it here, which I am able to do by the aid of Mr. Champion, who has been so kind as to copy it for me.

"*Phalidura mirabilis* MacLeay.

Titul. fig. II.

Genus Phalidurae *sane mirabile, ad Curculionites pertinens, rostro gaudet abbreviato obtuso, aperto, labro nullo adparente ita ut mandibulae fortes, latae, triangulares, inclinatae, rostri psittacini ad instar, in conspectum veniant. Reliquae partes individuo meo deficere videntur. Mentum adpendicem triangularem habet. Antennae fractae 7-articulis liberis, sed articuli clavae oblongae, apice acuminatae ita sunt adproximatae, ut numerus eorum certe oculis meis occultetur. Pili parui, per quatuor series dispositi, quatuor etiam articulos suspicari sinunt.* Ph. tota nigra, supra variolosa.

Hab. Nova Hollandia."

This diagnosis and the mention of *mirabilis* MacLeay as the type settle the question as to how the name must be applied.

In the Munich catalogue of Coleoptera, Vol. viii, 1871, Gemminger and Harold altered Fischer's name to *Psalidura*, and this has since been used, but it cannot be accepted, as it amounts to the replacement of an old name by a newer one, *Phalidura* and *Psalidura* being quite distinct words.

I have already mentioned that among the first described species of *Amycteridae* was the *Curculio mirabilis* of Kirby, and it has been taken for granted that this is the type of the genus *Phalidura*. Dr. Ferguson has, however, pointed out that there is good reason for believing that MacLeay was wrong in his identification of Kirby's insect, and on referring to Kirby's description and figure I think there can be no doubt that he is correct. Neither of these is applicable to MacLeay's "*mirabilis*," but they are fairly congruous with an insect of the *impressa*-group. *P. impressa* is the commoner of the Australian large *Phalidurae*, and in an extensive old collection that came into my possession there is a male of *impressa* bearing the label "*P. mirabilis* Kirby, *impressa* Boisduv.," and another short series of the same species with the general label "*P. mirabilis* Kirby, Tasmania." I have little doubt that if Kirby's type can be found it will prove to be the common Australian and Tasmanian species usually known as *impressa* Boisd.,

though, as there are several species closely allied to it already known, it may prove to be an ally rather than *P. impressa* itself, for the figure of the male sexual mechanism is not satisfactory for that of *P. impressa*, though the discrepancies may be partially if not wholly due to foreshortening.

The character of *Phalidura* that has most impressed systematic writers is a peculiar development of forceps at the posterior extremity of the body so that they have been compared with those that are so well known in earwigs (*Forficulidae*), and I propose to make use of that character in a systematic manner to define the genera which at present are confined to one, and as to the limits of which from *Talaurinus* authorities are not agreed.

The differences in the last ventral plate are unusual. In the *Curculionidae* the rule is that the true last ventral is membranous with a chitinised patch, differing in size and in form, on each side of the middle, so that the segment may be said to consist of two pieces, or to be "divided." This plate is entirely concealed in the body, and forms the floor of the genital orifice through which the median lobe is extended in functional activity, only the fork of the spiculum and its adjunct or augments intervening between the median lobe and the ventral plate. This is the case with most of the *Amycteridae*, cf. *Acantholophus*, *Cubicorhynchus*, etc.

In *Talaurinus* and its allies the two chitinous pieces of the plate exhibit a remarkable series of developments which attains its maximum in *Phalidura*. These developments appear to me to be probably adequate for purposes of taxonomy: and by adding to them the distinctions that are found in the last dorsal and certain peculiar developments that exist in connection with the extensive membrane that connects the true last ventral with the penultimate, I have been able to draw up this paper.

With *Talaurinus* I cannot deal at present, but I expect it will prove more difficult than the Phalidurines, and I anticipate that the line separating the two will have to be a matter of compromise.

It may be well to remark that the terminal body-segment in Rhynchophora is not so simple as it appears on superficial inspection, for it is the seat of infoldings that sometimes go to a great extent and are only detected by examining the interior aspect of the segment. Also that the intersegmental membranes may be extensive and complexly folded. In some of the Orders of insects (*e. g.* Lepidoptera) the modified terminal segments are treated as parts of the genitalia. In Coleoptera they have been but little studied.

PHALIDURINES, trib. nov. Amyeteridarum.

Maris segmento ultimo ventrali lateribus ad superficiem corporis excurrentibus, plus minusve prolongatis.

The tribe besides having the apices of the last ventral brought to the surface (either as a branch of a visible pair of forceps or as a minute hard tubercle) has a process attached internally to the membrane at the base of this sternite, giving attachment to large muscles.

There are known to me four forms of the tribe, two having the last dorsal plate (tergite) very highly modified and prominent, so that it projects between the blades of the forceps of the last ventral; while in the other two the modification of this tergite is less, so that it does not actually penetrate between the forceps.

They may be tabulated as follows:—

1 (4) Last dorsal plate swollen so as to penetrate between the projecting processes of the last ventral.
2 (3) Forceps of last ventral elongate and linear ..... PHALIDURA.
3 (2) Forceps of last ventral thick, short, looking like a clenched nail. ..... EUSTATIUS.
4 (1) Last dorsal plate so folded as to be placed behind the ventral processes.
5 (6) Ventral processes (usually long) connected basally only by membrane. ..... APHALIDURA.
6 (5) Ventral processes connected at base by a transverse bar. ..... PROPHALIDURA.

PHALIDURA Fisch. (1823).

This genus contains the largest and most highly-developed forms of the family. The abdomen is capable of great flexion, so that the long forceps can be directed forwards. In order to permit this, the penultimate tergite is remarkably elongate; the blades of the forceps sometimes have a small lamina, sometimes are quite destitute of one.

The type of the genus is *P. reticulata* Boisd. (= *mirabilis* MacLeay, nec Kirby). It includes groups 1 and 2 of Ferguson's revision, and probably most of his other species as far as group 6.

EUSTATIUS, gen. nov.

Maris segmento ultimo ventrali processum crassum haud prominulum formante.

This is a squat black insect of peculiar shape, with the last dorsal plate turned to the under surface of the body and there exposed to the length of $1\frac{3}{4}$ mm.; at its sides the ends of the blunt forceps are exposed, and look like clenched nails. These processes on dissection are found to

be broadly separate by intervening membrane, having in the middle a small process for the attachment of muscles.

Eustatius fergusoni, sp. n.

♂. Latus, parum convexus, niger; thorace transverso, dense argute granulato; elytris subcostatis interstitiis foveatis. Long. 16, *lat.* 7 *mm.*

Hab. Australia (Coomoo in 1886).

I have seen but one specimen of this species, and it does not resemble any other known to me. The sculpture of the thorax consists of flattened granules or small tubercles very evenly distributed; its length scarcely 5 mm., its breadth 5½; it is broader than the base of the elytra, but narrower than their broadest part. The elytra are much rounded at the sides, with blunt shoulders not at all accommodated to the thorax; they have each seven serial elevations of which the 2nd, 4th, and 6th are less than the others and consist of granulations, connected on the 2nd but separated on the 4th and 6th; between these ribs there are large depressions, separated each from the following only by a fine transverse elevation which is more or less indistinctly granulate; there are no projections at the apex. The legs are rather stout for this family. The metasternum is extremely short, not impressed, in front slightly margined, and in the middle sending off in front of the margin a minute process that meets the mesosternum between the legs.

The last ventral plate (the true 8th) is divided, the two pieces very thick, obtuse, very like a pair of widely separated mandibles. There is only membrane between them at the base, but from the inner face of this membrane there projects a small but rather stout, conical, black process, only the end of which is laminar in form; 5th (really 7th) ventral plate also highly modified, its hind margin folded forwards so as to make a highly-polished area on the inside of the body which is the support of the preanal fossa visible on the outside; in front of the preanal fossa the surface is impressed, and has some hair which is condensed on each side to form a fascicle after the manner of *Phalidura*.

The last dorsal is highly modified; its inflexed portion has three faces and is very irregular in form, the outer part (the really anterior) is curved, 2 mm. long, with much short hair, and above that impressed for the accommodation of the ventral processes; after the hair it is abruptly doubled in, the first part of the inflexion (which is invisible without dissection) being dull, and beyond that highly polished. The penultimate is simple, transverse, 2¾ mm. long, 4¼ broad. The spiculum is rather stout, with a roughly rounded dilatation at the free extremity;

the fork very asymmetrical, one branch being nearly absent and the other almost like a continuation of the rod; there is a somewhat strongly chitinised part of the adjacent membrane densely studded with minute asperities.

The tegmen has a small bridge (not, however, so minute as in the allied genera); the strut is stout, much dilated at the extremity. Median lobe strongly bent, the apex a little prolonged and recurved and nearly truncate, just visibly emarginate; the struts are long and broad, connected with the body by a slender junction; median orifice placed far from the tip, and owing to the abrupt deflection looking backwards as much as upwards, it exhibits a pair of definite hard pieces (volets or hinge apparatus), the diameter of the body is swollen on each side of the median orifice. The sac is large, as long as the struts, with a small secondary lobe concealed by the tegmen-strut; the apical part densely covered by minute structures making it dark and the transfer apparatus difficult to see, but apparently it is of the duplicate form, much as in other Phalidurinae. I see no subtegminal diverticulum.

The only specimen of this interesting insect has apparently lived among some pallid clay, which adheres and obscures the minute clothing.

Aphalidura, gen. nov.

Mas, segmento ultimo ventrali processubus ad superficiem provenientibus, membrana absque processu transverso.

This genus is probably a composite one, as it is defined by negative characters, and will comprise those species at present placed in *Phalidura* in which the last dorsal is folded back behind the forceps without bulging forwards between their blades, though in some species it sends long hairs between the blades. The type is *P. impressa* (Boisd.) which may, as previously stated, prove to be *mirabilis* Kirby. This insect has the membrane of the 8th ventral plate provided with a vertical lamina as in *Phalidura*, and should there be similar species without a lamina, they should be rejected from the genus. *P. sloanei* Ferg., *breviformis* F., and probably other of his *Psalidurae* belong to it.

Prophalidura, gen. nov.

Mas, segmento ultimo ventrali utrinque tuberculum vix prominentem formante; ad basin lamina transversa munito, ante hanc lamina verticali interna.

The type of this genus is *Talaurinus riverinae* MacLeay. The characters are that the two divisions of the last ventral are hard thick pieces, not forming forceps, but coming to the surface where they are visible, as minute acuminate tubercles at the outside of the last dorsal,

one on each side; these pieces are connected at their base by a transverse bar, which is connected with them so that its points act as pivots; in front of this bar there is a strong vertical lamina. There are various species of *Talaurinus* more or less similar to those of *Prophalidura*, but I think the genus should not include any that do not exhibit the characters mentioned above. The species are extremely difficult to define, and will, I believe, be found to be best distinguished by the slight differences that exist in the structures of the copulatory apparatus. I am unable to determine any of the species, except *P. riverinae*, as known to Ferguson. I think, therefore, that the three known to me may be considered by him as varieties of *P. riverinae*, which I think is not the case. I will briefly define one of them.

Prophalidura truncata, sp. n.

Nigra tomento sordido obscurata; prothorace pallido-trivittato, fortiter tuberculato, elytris granulis parvis elevatis anterius obsoletis. Long. 12, *lat.* 6½ *mm.*

Very closely allied to *P. riverinae*, but smaller and narrower; the tubercles of the thorax are large, but the granules on the elytra are smaller and less distinct. The setosity of the upper surface is well marked, pallid. There is no projection at the tip of the elytra, and in the male there is the same truncate appearance as in *riverinae*.

In the male the 5th ventral plate is formed much as in *riverinae*, though the impressions are not quite so marked; the processes of the last ventral are smaller: the last dorsal is narrower and its folding-over a little different at the line of doubling.

The spiculum is smaller and the dilatation near its base is obsolete. The median lobe is shorter and more bent, and a little more pointed.

The pair of this species come from an old collection and are labelled "*P. truncata*, Australia." I expect that when the sac is everted it will prove the form to be really distinct.

Brockenhurst.
September 18th, 1919.

ABAX (*PTEROSTICHUS*) *PARALLELUS* DUFTS., A BEETLE NEW TO BRITAIN.

BY K. G. BLAIR, B.SC, F.E.S.

A single specimen of *Abax parallelus* Dufts. was taken by my brother, Wm. N. Blair, on the island of St. Mary's, Scilly, in July 1913, and given to me, but its identity was not recognised until I came to